CLAIMS

What is claimed is:

1. An isolated polynucleotide that encodes a plant cysteine γ synthase having amino acid sequence identity of at least 95% based on the Clustal method of alignment when compared to a polypeptide selected from the group consisting of SEQ ID NOs:31, 62, and 64.

2. The polynucleotide of Claim 1 wherein the polynucleotide encodes a polypeptide selected from the group consisting of SEQ ID NOs: NOs:31, 62, and 64.

3. The polynucleotide of Claim 1, wherein the polynucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:30, 61, and 63.

4. An isolated complement of the polynucleotide of Claim 1, wherein (a) the complement and the polynucleotide consist of the same number of nucleotides, and (b) the nucleotide sequences of the complement and the polynucleotide have 100% complementarity.

5. An isolated nucleic acid molecule that (1) comprises at least 180 nucleotides (2) remains hybridized with a polynucleotide having a nucleotide sequence selected from the group consisting of SEQ ID NO:30, 61, and 63 under a wash condition of 0.1X SSC, 0.1% SDS, and 65°C, and encodes a plant cysteine γ synthase.

6. A cell comprising the polynucleotide of Claim 1.

7. The cell of Claim 6, wherein the cell is selected from the group consisting of a yeast cell, a bacterial cell and a plant cell.

8. A transgenic plant comprising the polynucleotide of Claim 1.

9. A method for transforming a cell comprising introducing into a cell the polynucleotide of Claim 1.

10. A method for producing a transgenic plant comprising (a) transforming a plant cell with the polynucleotide of Claim 1, and (b) regenerating a plant from the transformed plant cell.

11. A method for producing a polynucleotide fragment comprising (a) selecting a nucleotide sequence comprised by the polynucleotide of Claim 1, and (b) synthesizing a polynucleotide fragment containing the nucleotide sequence.

12. The method of Claim 11, wherein the fragment is produced *in vivo*.

13. A chimeric gene comprising the polynucleotide of Claim 1 operably linked to at least one regulatory sequence.

14. A method for altering the level of cysteine γ synthase expression in a host cell, the method comprising:

(a) Transforming a host cell with the chimeric gene of Claim 13; and

(b) growing the transformed cell from step (a) under conditions suitable for the expression of the chimeric gene.

15. A method for evaluating a compound for its ability to inhibit the activity of a plant cysteine γ synthase, the method comprising the steps of:

(a) transforming a host cell with a chimeric gene comprising a polynucleotide of Claim 1, operably linked to at least one regulatory sequence;

(b) growing the transformed host cell under conditions that are suitable for expression of the chimeric gene wherein expression of the chimeric gene results in production of the plant biosynthetic enzyme encoded by the operably linked nucleic acid fragment in the transformed host cell;

(c) optionally purifying the plant biosynthetic enzyme polypeptide expressed by the transformed host cell;

(d) treating the plant biosynthetic enzyme with a compound to be tested;

(e) comparing the activity of the plant biosynthetic enzyme that has been treated with a test compound to the activity of an untreated plant biosynthetic enzyme polypeptide; and

(f) selecting the compound that inhibits the activity of cysteine γ synthase.